

CLAIMS

What is claimed is:

1. A method for raising NO:hemoglobin in red blood cells in a mammal,
comprising administering to the mammal a therapeutically effective amount of a
composition comprising NO, a composition comprising an inorganic nitrite, a
composition comprising an organic nitrite, or a composition comprising a donor
of biologically active NO.
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2. A method for alleviating the effects of a medical intervention in a human, said
intervention resulting in a low NO:hemoglobin ratio in red blood cells, said
method comprising administering to the mammal a therapeutically effective
amount of a composition comprising NO, a composition comprising an
inorganic nitrite, a composition comprising an organic nitrite, or a composition
comprising a donor of biologically active NO.
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3. The method of Claim 2 in which the medical intervention comprises treatment
with erythropoietin, treatment by blood transfusion, or treatment with one or
more hemoglobin-based blood substitutes.
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4. A method for treating a condition in a mammal associated with a low
NO:hemoglobin ratio in red blood cells, said method comprising administering
to the mammal a therapeutically effective amount of a composition comprising
NO, a composition comprising an inorganic nitrite, a composition comprising an
organic nitrite, or a composition comprising a donor of biologically active NO.
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5. The method of Claim 4 in which the condition is systemic hypertension, pulmonary hypertension, stroke, myocardial infarction, sickle cell disease, sepsis, thalassemia, polycythemia, a congenital disorder of red blood cells, coronary disease, or a hypoxic condition.

5 6. A method for treating pulmonary hypertension in a mammal, comprising administering to the mammal a therapeutically effective amount of a composition comprising NO, a composition comprising an inorganic nitrite, a composition comprising an organic nitrite, or a composition comprising a donor of biologically active NO.

10 7. A method for treating sickle cell disease in a human, comprising administering to the human a therapeutically effective amount of a composition comprising NO, a composition comprising an inorganic nitrite, a composition comprising an organic nitrite, or a composition comprising a donor of biologically active NO.

8. A method for increasing coronary blood flow in a mammal, comprising administering to the human a therapeutically effective amount of a composition comprising NO, a composition comprising an inorganic nitrite, a composition comprising an organic nitrite, or a composition comprising a donor of biologically active NO.

15 9. A method for treating a hypoxic condition in a mammal, comprising administering to the human a therapeutically effective amount of a composition comprising NO, a composition comprising an inorganic nitrite, a composition comprising an organic nitrite, or a composition comprising a donor of biologically active NO.

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10. A method for raising NO:hemoglobin in red blood cells in a mammal, comprising administering to the mammal a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

11. A method for alleviating the effects of a medical intervention in a human, said medical intervention resulting in a low NO:hemoglobin ratio in red blood cells, said method comprising administering to the human a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

12. The method of Claim 11 in which the medical intervention comprises treatment with erythropoietin, treatment by blood transfusion, or treatment with one or more hemoglobin-based blood substitutes.

13. A method for treating a condition in a mammal associated with a low NO:hemoglobin ratio in red blood cells, said method comprising administering to the human a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

14. The method of Claim 13 in which the condition is systemic hypertension, pulmonary hypertension, stroke, myocardial infarction, sickle cell disease, sepsis, thalassemia, polycythemia, a congenital disorder of red blood cells, coronary disease, or a hypoxic condition.

20 15. A method for treating pulmonary hypertension in a mammal, comprising administering to the mammal a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

16. A method for treating sickle cell disease in a human, comprising administering to the human a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

17. A method for increasing coronary blood flow in a mammal, comprising 5 administering to the mammal a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

18. A method for treating a hypoxic condition in a mammal, comprising administering to the mammal a therapeutically effective amount of a composition comprising red blood cells enriched with biologically active NO.

10 19. A method for increasing biologically active NO in isolated red blood cells, comprising contacting the isolated red blood cells with a composition comprising a reagent selected from the group consisting of: NO, an S-nitrosothiol, an ester of an S-nitrosothiol, and ethyl nitrite.

20. The method of Claim 19 wherein the S-nitrosothiol is S-nitrosoglutathione.

15 21. A method for potentiating NO-mediated bioactivity of red blood cells, said method comprising administering to the mammal a therapeutically effective amount of a composition comprising a thiol.

22. The method of Claim 21 wherein the thiol is glutathione.

23. A method for restoring NO:hemoglobin to a value in a desirable range, in blood 20 for transfusion, said method comprising contacting the blood with a solution

comprising a reagent selected from the group consisting of: NO, an S-nitrosothiol, an ester of an S-nitrosothiol, and ethyl nitrite.

24. A method for potentiating the activity of blood for transfusion, comprising adding to the blood a composition comprising one or more thiols.
- 5 25. A method for identifying a human candidate for a condition associated with a low NO:Hb ratio in red blood cells, said method comprising measuring NO content as S-nitrosothiol and as iron nitrosylhemoglobin in red blood cells isolated from a human, measuring hemoglobin content in the red blood cells isolated from the human, determining a NO:Hb ratio, and comparing the NO:Hb ratio to a normal mean value for NO:Hb, wherein if the NO:Hb ratio is significantly below the normal mean value, the human is a candidate for a condition associated with a low NO:Hb ratio in red blood cells.
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26. A method for raising NO:hemoglobin as SNO in red blood cells in a mammal to a desirable value, comprising administering to the mammal a therapeutically effective amount of a composition comprising NO, a composition comprising an inorganic nitrite, a composition comprising an organic nitrite, or a composition comprising a donor of biologically active NO.
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